

The primary purpose of this news letter and others to follow is to provide information to all IGY personnel at Little America about the general scientific situation and progress at other Antarctic stations. The main contents will be the periodic SITREPS (situation reports) of IGY activities from Little America, Byrd, South Pole, Cape Adare, Wilkes and Ellsworth stations. Other information received of these as well as foreign Antarctic bases may be added later. Special details of the Little America Station operations, including preliminary results may also appear if time is available. Suggestions of additional topics of information would be welcomed. It is hoped that this news letter will be ready for distribution about the 10th of each month hereafter. (A.P.C.-Ed.)

SITREPS TO DATE

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Little America

No. 1, 28 Feb, 1957 * AURORA. Estimated completion of construction 6 March, Estimated full operation 15 March. GEOMAG. Buildings moved, completed except for tunnel and wiring. Estimated operation 1 April. GLAC. Base program operative. Aerial reconnaissance LAS traverse planned early March. IONO. Operations waiting construction of antennas. Expected operation 1 April. MET OBS. Complete surface observations underway and two balloon ascensions daily to start 1 March. Special observations 50% operative, estimated 100% 1 April. MICROMET AND RADIATION. 75% operative, estimate 100% 6 March. PHYSIOLOGY. Operative 1 March. SEIS AND GRAV base program estimated operative 1 April. WEA CENT. Unchanged. Now receive New Zealand weather twice daily. New communication building operative 1 April. New communication equipment at McMurdo expected operative 1 June.

No. 2, 31 March, 1957* AURORA. Visual program began 21 March. All sky camera, spectrograph operative. Meteor radar estimated operative 1 May. GEOMAG. Wiring and tunnel to new geomag buildings 75% complete, estimate 100% 3 April. Standard magnetograph operation estimated 10 April. Rapid run, visual estimated 1 May. GLAC. Relative movement 8 by 10 kms completed. Observations elevation at camp-site completed. 56 accumulation stakes, shallow pit studies, ice temperatures to 10 meters being observed periodically. Deep pit operations start early April. Oceanographic studies delayed until bay ice freezes. Two recon flights made, one combined with supply flight to McMurdo but surface visibility zero. IONO. Antenna up and equipment operative. Waiting completion IGY darkroom, estimated 2 April. Noise study at Little America under study. MET OBS. Complete surface observations, two balloon ascensions daily made during March. Following special programs operative: ozone, dust sampling, radiation fallout, net and hemispherical radiometer, normal incidence radiometer, pyrhelometer up and down, illuminometer up and down, temperature 6 levels - 2 m. in snow to 16 m. above surface, chemical snow sampling. Carbon dioxide analyzer estimated operational 15 April. Infra-red estimated operative 1 May. MICROMET AND RADIATION. Sun and sky radiation up and down, net radiation up and down 100% operative. Normal incidence obtained 7 days during month, halo observations 19 days during month. Sastrugi movements, erosion and accumulation observations made. Densities and compaction distances observed at original deep pit of Little America III. 5 level anemometers, 14 level thermocouples, 2 heat transducers operative 1 April. PHYSIOLOGY. 8 persons completed BMR and cold exposure tests. 6 persons completed diet study, skinfolds and clinical exams. SEIS AND GRAV. Experimental seismic studies for methods of thickness of ice and depth of water successfully completed first site. Instruments installed in Snocat ready for series of local observations. Gravity observations in local area to start 1 Apr. WEA CENTRAL. Data: New Zealand and Australia reports received 70% reliability, unable to receive South America or South Africa. Receiving US Antarctic data but some 24 hrs old because weather transmitted only once daily. Negligible data other Antarctic stations. Analysis: Surface maps drawn 4 times daily and

700, 500, 300 mb maps once daily for regions where data available. Time sections, adiabatic charts completed for available Antarctic stations. Weather collections: not being made here. Communication awaiting frequency assignment and installation additional equipment. Estimated operation weather collective broadcast 20 May, analysis broadcast 1 June if data available. GENERAL. Power failures during period 10 to 31 March total 25 with 25.5 hrs lost.

No. 3, 2 May, 1957* AURORA. Frequent electronic failures of both regular and spare spectrograph interrupting program. All sky camera operation satisfactory. Visual observations continue hourly. Meteor radar program will start after troubles with spectrograph cleared. GEOMAG. Tunnel construction and bldg wiring completed. Standard magnetograph in full operation since 25 April. Rapid run under test. Visible in operation. GLAC. Deep pit at 8 meters. Shallow pit studies made 20 and 40 mi sites on Byrd trail during one week traverse operation with seis and grav. Ocean studies started 22 April with 14 point station off temperatures and samples to 600 meters in Kainan Bay. Ocean current measurements started 29 April. IONO. Recorder under operational tests, repair, rewiring during month. Still considered too unreliable for continued operation but end of tests expected shortly. Noise program plans at Little America abandoned by direction from Boulder. MET OBS. No change with twice daily balloon ascensions, surface obs and special programs previously reported. Average balloon height 20.8 kms. Carbon dioxide analyzer in operation since 20 April. Infra-red equipment operating 30 April but calibration in question because of necessary changes in bridge circuit. MICROMET AND RADIATION. Continued observations from last report. Normal incidence observed twice during April. Temperature profiles from thermocouple operation most of April but results not entirely satisfactory and testing continues. Excellent wind profiles obtained. Heat transducers not yet in operation. PHYSIOLOGY. Investigation of vascular reactivity as index of local cold acclimatization 90% completed. Two point discrimination in extremities started. Field thermal balance studies will begin during May. SEIS AND GRAV. Continued experimental deflection studies at five local sites, 20 mile and 40 mile sites Byrd trail. Gravimeter at Little America shows vertical shelf movement large enough to prevent detailed local variation study. Two different types of meters duplicate well with movements about forty second period. Motion very small 7 miles from base, gone entirely at 20 and 40 mi distances. WEA CENTRAL. Data: Antarctic stations received 8 to 48 hours late. Have heard Buenas Aires and Santiago twice. South Africa heard about 12 times during April. Reliability of reception New Zealand and Australian reports still average about 70%. Analysis: Surface and upper air charts are not analyzed until 48 hours old. Analyzing 00, 06, 12 and 18Z surface charts, 00 and 12Z for 700, 500, 300 mb charts for areas where data available. Analyzing time sections for 9 Antarctic stations. Sending 700 mb analysis to Pole Station. GENERAL. Power situation much improved.

Byrd Station

No. 1, 9 Feb* Awaiting second sled swing, C-124 drop. Constructing IONOSPHERE sounding antenna. All well, eager to complete station.

No. 2, 16 Feb* IONO mast erected. Bldg 6 (science) shell completed. Lack experience and material, slow progress. Surface MET program expanding as unpacking proceeds. Byrd Sta traverse party expected 26 or 27 Feb. Cooperation highest order on above jobs.

No. 3, 23 Feb* Little construction owing to airdrop recovery. Two scheduled pibals daily since 17 Feb.

No. 4, 3 March* Byrd Sta traverse party completed successful, uneventful traverse 27 Feb. Preparing SEISMIC refraction profile 3 to 13 miles from station. Bldg 10 (inflation shelter) shell up, modified due to material, convenience. To use side release door for first winter. Provision incorporated for roof release hatch when drift necessitates. Bldg 7 (geomag absolute) shell up. IONO antenna rigged. Designing revised AURORA tower, special sunspot observations

begun. Airdrop fuel recovered, cached and interiors progressing. Hoping for R4D flight from LAS with critical materials. Temp range +5 to -37.

No. 5, 10 March* MET: Sun lines for orientation GMD taken. GMD assembled westerly end of roof Bldg 2 in lieu rawin tower in view of missing tower components, pressure of time, and expected drift this season. Bldg 8 (GEOMAG variation) shell up. Walls 7½ ft instead of 12 for ease in handling, efficient heating. Conducting SEISMIC refraction, wind noise delaying operation. IONO antenna completion awaiting construction AURORA tower legs. R4D flight delivered aluminum nails, timbers for GEOMAG piers, materials for AURORA tower. Winds to 35 knots, blowing snow hampers outside work. Temp range -1 to -33.

No. 6, 17 March* Preparation for erection AURORA tower complete. Constructing GEOMAG piers. Accumulation stakes set out 1600 ft N and E of station. Base line for movement net surveyed. MET. Radome erected. All met ground equipment and electric hookup complete. Completed SEISMIC refraction profile, near-surface velocity studies. Ice thickness under station above 3000 meters. Snocat 'Carole' transfer case replaced, undergoing overhaul. Station time advanced 2 hours to utilize sunlight. Temp -5 to -40.

No. 7, 24 March* Two AURORA tower legs erected astraddle Bldg 6 following abortive first attempt and modifications. MET. Low pressure hydrogen generator completed with locally manufactured parts. First successful rasonde flight 0300, 23 March. Constructing tunnel and covered storage areas with drums, chutes, pipe, etc, and chicken wire. Winds high 20s and heavy blowing snow. Temp -3 to -46.

No. 8, 31 March* Second pair AURORA tower legs erected and guyed temporarily after both base plates rewelded. First visual aurora noted 27 March. Preparing plans and materials for GLAC deep pit. IONO antenna completed to wall Bldg 6, slightly damaged by falling AURORA tower legs. MET. Rawin program hampered by breaking balloons, defective radiosondes, heating problems in radome and Bldg 10. Most science stores under cover. Winds 30+ knots, heavy blowing snow delays outside work. Wind chill factor to 2500. Ten participants evening code class.

No. 9, 7 April* AURORA tower frame complete. Survey movement net (GLAC) delayed by vapor from station. SEISMIC explosives stored in 10' snow pit, temp -20. Overhaul 'Carole' complete, 'Buttons' in garage. Temp -22 to -68.

No. 10, 14 April* AURORA tower complete. Bldg 11 (aurora observatory) shell complete. MET Bldg 9 (utility for inflation shelter) constructed scrap lumber and spare building panel. Temp range -8 to -46.

No. 11, 21 April* Access shaft roof hatch Bldg 6, floor hatch Bldg 11 constructed rawin tower panels. GLAC deep pit and traverse storage shelter 20x20 x9 ft constructed from drums, chicken wire, parachutes adjoining easterly end Bldg 6, and clearing snow to summer level commenced. 6x6x8 ft station SEIS pits with 8' long entrance tunnels dug, roofed with rawin tower panels. Horizontal seismos leveled and zeroed N-S, E-W. Photo darkroom wired. 6 days heavy blowing snow, winds 25 knots or more, max 43 from 030. Temp range 0 to -37.

No. 12, 28 April* MET supplies in covered storage. Herman Nelsen heater in Bldg 9. Thermohm temperature recorder installed. Bldg 10 wired and lighted for inflation and balloon release. Ceiling light erected. Second daily rawinsonde at 1200Z commenced. SEISMIC recorder darkroom constructed in Bldg 2. Snocat 'Buttons' overhaul complete. Snocat 'Gallirallus Australis Hectori' in garage. Temp range -10 to -52.

No. 13, 5 May* First AURORA dome mounted. GEOMAG piers completed, awaiting installation. GLAC thermohm string for snow temperatures installed at depths 0, ½, 1, 2, 4, 8 and 16 meters. Vertical station SEISMOGRAPH installed and leveled. Temp range -28 to -64.

Pole Station

No. 1, 25 Jan 57* GENERAL: 4 of 9 IGY personnel present. 8 of 9 Navy personnel present, one incapacitated past 3 weeks. Station safely livable but lacks many items considered important to program and winter night existence contained in 25% undelivered supplies. IGY personnel spend half work day on community outdoor labor, remainder on own projects. Last air delivery 8 Jan. AURORA boxes all here except 15 and 19, with contents 3 badly damaged. Landolt at McMurdo. GLAC boxes all here except 1,2,3,7 and 13. Remington at McMurdo. SEIS lab test in progress. All GEOMAG boxes received. Variometer lab test in progress. IONOSPHERE boxes not yet delivered: 14, 25, 31 thru 35. Damages to boxes 8 and 27 included bent pendulum, restoration doubtful; clock error variable about 8 sec per day. 2 spare 35 mm film magazines and the 2 scaling glasses completely shattered. Transmitter filament transformers damaged. C3 recorder auxiliary unit and filament circuits functioning OK. Antenna mast on hand permits 25 ft height, awaiting additional sections from McMurdo to make necessary 75' mast. Hough here, Benson at McMurdo. METEOROLOGY: Surface weather observations being taken at 3 hour intervals, 2100 through 1200Z. Commencing this date 1800 thru 1200Z. USWB thermoscreen erected complete with exposed minimum thermometers and thermograph. Aerovane installed on temporary 10 ft mast, indicator working but no paper for recorder. 3-cup totalizing anemometer temporarily installed at ground level, no cable for connection to indicators. Precipitation gage installed, radiosonde receiver equipment installation awaiting receipt GMD components and cable. Net exchange radiometer operating with Azar recorder, but plate temperature cannot be measured. Rawin dome shell erected except top cover, awaiting brass nuts for completion. Hydrogen generator assembled, inflation shelter needs finishing touches. Temperature records taken prior to 11 Jan contain certain indeterminate errors due to poor design improvised shelter. Subsequent comparisons indicate old shelter gave temperatures 3 to 20° warmer than true. Improbable any summer temperature went above 0° F. Flowers and Guerrero present, Johnson and Hanson at McMurdo.

No. 2, 27 Feb, 57* All IGY and Navy personnel present 12 Feb. Final air-drops completed 12 Feb. Most requirements material including barracks received. Information will be sent later on important items unrecovered from stream-ins or otherwise not received. Temperature dropping fast. Erected barracks -62 F on 26 Feb. Have dug 400 ft snow tunnel toward SEISMIC site. Except for limited MET observations scientific work is at a standstill pending all-out effort to secure station against winter night. Expect diesel fuel in tunnels to begin freezing before sun goes down. Hope to begin routine scientific observations before 1 April.

No. 3, 29 March 57* Outdoor work essentially completed 22 March. Scientists full time on own projects beginning 25 March. Temp minimum for March -37, maximum -2, continuous winds 10 to 18 mph most days. AURORA tower heated and domes in since 13 March but continuous experimentation has failed to keep frost cleared from domes adequately. Instruments prepared for mounting. IONO C3 relay giving trouble, preliminary photo records since 10 March. GEOMAG and SEISMIC pits completed 20 March along 100 ft snow tunnel. Instruments to be mounted early April. Seismic pit 1/2 mile from garage power house vibration. MET: continued surface observation schedule at six hour intervals. First rawinsonde 27 March, expect normal schedule to begin 1 April. Current upper air inversion about 43 F first 800 ft. GLAC snow stakes set. Drift study of camp area made. Rammsondes made in selected areas. Thermohms from surface to 4 meters. Snow cold lab to be completed early April and deep pit started. MED BIOLOGICAL program begun. PHYSIOLOGY study begun. Combined ASTRONOMY and pibal building completed windward side inflation shelter serves pre heatroom for inflation. All well, morale high.

No. 4, 28 April 57* 1 April began subterranean snow mine sloping 20° to serve jointly as water supply and GLAC deep snow pit, now down approx 20 ft. Shell of cold lab in tunnel cache system adjoining to science building completed.

8x20 ft darkroom in head divided scientific and recreational. Scientific section in full operation since 15 April. MET began night and day shifts 15 April. Considerable difficulty with intermittent heat for inflation shelter. Herman Nelson inflation shelter now housed in low astronomy bldg ready for operation 1 May. Pibal dome is mounted over enclosed platform to insulate it from main room heat. Instrument pier runs down through floor and is frozen in snow for stability. Difficulty keeping theodolite limber below -60 F. Test of astro photography encouraging. IONO observations routine. 16 mm recorder checked out ready for SWD and RWD intervals. MAGNETOGRAPH required special insulation and heater to keep batteries and recorder warm. Will be installed in permanent location soon. SEISMOGRAPHS being cold tested; having trouble with recorder, but expect full operation soon. AURORA all-sky camera in place, testing complete. Domes intermittently clear. April twilight and aurora spectra film being analyzed. Greatest apparent aurora outburst 192330, vivid coloration. April min -39.1, max -25.6 F, max wind 34 knots, wind chill 3100. Min snow temperature at surface -91, at 30 ft depth -58.8. Max temperature difference snow surface and 30ft elevation 20°. Surface temperature inversion average 25° C at 1800 ft. Tropopause still well defined at about 260 mb minus 65°C. 45 successful raob ascents to date. Receiving daily 700 mb weather canned maps. Ingenious Taylor insomimeter for small group sleep habit analysis in operation. Seedling in attempted hydroponics garden killed by fungus and molds. Health and morale good.

Adare Station

No. 1 (not available)

No. 2, 1 Feb, 57* All buildings and antenna towers complete. Minor utility work remains. Estimate completion base construction work early Feb. Weather installation complete except for upper air radiation. Other sciences beginning installation. Permanent communications partially complete. Ham installation awaits delivery antenna spacers in late cargo. All personnel well and sound.

No. 3 17 Feb 57* MCB one detachment departed 12 Feb. 95% penguins have left. Beach supply dump hit by waves, now moved to higher ground. Auxiliary bldg for evaporators and water storage under construction. Upper air observations at 0300Z only to start 22 Feb. 1500Z observations to be added 1 March. Estimate completion date permanent communication installation 1 April. Radio homing beacon to be activated approx 21 Feb. Amateur radio waits completion these projects. Weather fine, health and morale personnel high.

No. 4, 21 March 57* GEOMAG complete and operating on test basis. SEISMIC 75% complete. AURORA and RADIATION just started. Raobs on two per day basis since 1 March. Sounding heights frequently limited by high eastern horizon. Health good, morale high.

No. 5, 29 April, 57* AURORA. Platforms built in tower with spectrograph and all sky camera mounted ready for trials. From limited auroral observations geomagnetic north, calculated by spherical trig appears best orientation. Bldgs oriented along dip meridian. No trouble as yet with dome frost. NZ scientists have built very adequate darkroom in bldg. GEOMAG. Operating routine basis. Several days spent moving fuel drums located around geomag hut as penguin barricade. SEISMOLOGY. Operating routinely. Short period vertical using two second galvanometer working satisfactorily, long period horizontal component picking up considerable ground unrest due to wind. Records often difficult to read. Long period vertical drifts badly. 12 quakes recorded in April, not always on all components. IONO. Trial recordings in progress, 16 mm cameras yet to be installed. Expect to start regular data scaling mid May. MET. All phases operating but radiation. Stray voltage pickup rendering records useless. Average April temp 4° F. Health and morale fine.

Wilkes Station

No. 1, 19 Feb 57* Wilkes Station commissioned Feb 16 and all ships departed Vincennes Bay early Feb 17. GLAC field work has begun. IONO program will begin March 1, COSMIC RAY March 15, AURORA and AIRGLOW March 4, SEISMOLOGY within 30 days, GEOMAG by May 1, METEOROLOGY full surface and upper air and first research program instruments will be set up within 10 days. GLAC snow studies will be carried out about 25 miles inland on ice cap. Have excellent access to area and we propose set up Jamesway hut for work parties. Duplicate WB Met instruments will be set up interior site.

No. 2, 1 March 57* MET. Equipment 90% unpacked and card indexed. General condition good. Shelving, storage space 80% complete. Estimated date installation radiation equipment April 15. Secondary met station to be set up in March at GLAC deep pit operation 25 to 50 mi inland on cap. SEISMOLOGY. Equipment arrived without apparent damage and brought indoors. Office containing timing equipment established science bldg and small light tight bldg nearby houses recording equipment. Radio time system set up. Recording instruments now being installed. Seismometers to be in another bldg on bedrock 150 ft away but lack of cement will delay installation. IONO and COSMIC. Ionosphere 80% complete to take records antenna 100% complete. 70% ionosphere boxes inside. No cosmic ray work started. All eqpt both disciplines accounted for. AURORA AND AIRGLOW. Spectrograph and all-sky camera installed in plastic domes and operating on experimental basis. Full visual and photographic program starts March 5. All-sky camera replaced due intermittent jamming. Now operating satisfactorily. Shorted LS-1 in spectrograph necessitated major overhaul program and assembly due lack exact replacement parts but working satisfactory now. First aurora observed Feb 25 1800 hours. Base darkroom not ready but completion expected soon. All supplies accounted for and unpacked or stowed. GEOMAG. All eqpt received and apparently in good condition. Magnetographs unpacked and awaiting completion carpentry in buildings. Not sure of condition yet. Storage shelves and large table and shelf built for record handling. One permanent triangulation monument drilled into solid rock. Floors of bldgs prepared for tiling. GLAC. Field work limited to assist station completion. Tritium samples from icecap, lichen collection from Clark Point, and rocks representative of area sent comus via USS Glacier. Trail laid 26 miles on icecap to 2300 ft altitude. Ablation-accumulation stakes set in along this and some snow studies made. Extensive snow study to be done in winter months 26 to 50 mi inland on cap. Instrument shelter with thermograph set up 4 mi east. Also series thermohms drilled here into ice to measure temperature. Deepest thermohm 16 meters. GLAC party now in field for week to study movement Vanderford Glacier south of station. All general IGY eqpt received except Box 46, in good condition.

No. 3, 8 April 57* GENERAL: Ice cap sta for glac and met studies established 50 mi ESE at 4000 ft elevation. Vincennes Bay still free of pack ice. AURORA AND AIRGLOW: Full program underway including film developing. Satisfactory aurora or airglow spectra and camera pictures obtained every night since 5 March. 44 out of 190 hrs observation during March were clear. Faint rays and glow observed sometimes during the course of almost every clear night. 3 hrs of meteor observations completed with rather low average count, about 2 per hour with binoculars. Not much higher without IONO: 100% complete. March 17 first day of 24 hr film records. These continuous except for weekly maintenance or slight malfunction of records. Record scaling behind few days but progressing satisfactory. COSMIC RAY: 90% complete. Would be complete except for anticipated move of equipment to eliminate ionosonde transmitter interference. GEOMAG: Bldgs tiled and light leaks eliminated. Tunnel weather proofed. Bldg rewired after moving all switch boxes into tunnel. All heaters installed. True bearings obtained from astro shots. DC power supply and program machine installed in office and all cables strung to variation bldg. Magnetograph installation awaits fire alarm system and results of effort to prevent snow drifting into building. Hope to operate both magnetographs on test basis by early May. GLAC: Relative movement

study initiated at ice cap station. Area under study covers approximately 9 square miles. 12 stakes surveyed. Tunnels and snow lab excavated in preparation for deep pit to be dug this site beginning May. Studies begun in area of Wilkes Station of large moraine along edge of ice sheet. Glacial geology and higher sea levels being investigated on Windmill Is group. Preliminary work begun on ice crystallography. Experimental photographic study sea ice conditions begun March 19 and continuing. SEISMOLOGY bldg shifted to new site and all instruments installed in this and recording shelter. Electrical connections made. Adjustments and testing now under way. MET : Surface and upper air programs routine basis. WB met office and storage facilities complete. Surface ob and snow sampling eqpt installed and operating. Interior ice cap station snow crystal replica program started.

No. 4, 3 May 57* AURORA AND AIRGLOW: Transformer in Applegate high voltage supply burned out due failure selenium rectifiers and insufficient fuse protection to cover such failure. Lack of spare parts necessitated redesign of unit for operation with 6X4 rectifiers and transformer borrowed from Navy. There are 322 observing hours during April. Of those 73 hours or 22% were clear, 25 hours or 8% had aurora and of these only 10 hours or 3 % were displays not occurring in low north. The ten hours of local aurora were faint and colorless. COSMIC RAY Move to new bldg completed and eqpt in operation on check out basis. 15 % difference between half telescopes being recorded. Believe due to binary scaling circuits. Counting rate of whole telescope remains lower than design. IONO operation continue except for 70 hours caused mainly by 3 and 6 kv circuit breaker malfunction. High absorption conditions begin April 3 and continue high to medium since. One weekly telegraphic summary of FOF2 and M3000F2 sent in. All spare parts and supplies stored Jamesway hut. GEOMAG: Std magnetograph now operating on test basis. Rapid-run in process of installation. Present high winds lift roof from walls destroying light-tight integrity of bldg. Expect to have all operations on routine basis by end of May. GLACIOLOGY: Movement stakes set on ramp to ice cap near station. Experimenting with device to measure snow drift. Photographic recording of sea ice conditions continued and study of sea ice started. Experiments with tide gauge stopped by extensive ice formations. Preparatory work for deep pit studies at inland stations and study of moraine continues. Outdoor work much delayed by stormy weather. METEOROLOGY: Surface and upper air programs continue satisfactory. April sounding avc 21216 meters. Releases handicapped by overhead release facilities, strong winds and rough terrain at release point. Snow cover variable, 0 to 12 ft. No cover around inflation bldg. Glaze deposited by freezing rain of April 18 persists as added handicap to observers. Erratic operation Azar recorders this station traced to interference from communications. Replaced wire with lead covered cable. Two day test with Eppley horizontal incidence pyrhelimeter has produced excellent results with no scatter. Ice cap station observations in progress. Station will be manned at least until glaciologists deep-pit operation complete. SEISMOLOGY: 3 components operating. Considerable drift, especially in vertical component. Violent microseismic activity observed during and following storms. 4 earthquakes recorded since April 15, two badly obscured by storms. Vincennes Bay still open.

Ellsworth Station

No. 1, 16 Feb. 57* All 9 IGY personnel present on 11 Feb when Ellsworth Sta was turned over and accepted on behalf of IGY as military commander and scientific leader. Severe ice conditions, spending 43 days in pack ice, delay in selecting station site, slow construction procedure, rapid advance of winter necessitating ships depart this area 14 days after arrival caused much lagging in completion of station. A tremendous amount of work remains to be done and sta should be fully operative with complete meteorological program by 1 April.

No 2, 10 March 57* MET: All surface observation instruments installed and complete surface program in operation. Rawin receiver installed on platform and plastic dome in place. Full aerological program for upper air advanced forward possibly 23 March. SEISMIC instruments and gravity meter installed in Snocat and now preparing possible seismic refraction profile eastward toward Moltke nunataks. GLACIOLOGY. Ablation and density study areas set up to SE of station. Thermohm firn temperature measuring network set up at depths to 16 m. Ice sheet movement measurement stake system now in process of being surveyed in. IONOSPHERE. 80' mast erected. All antenna and transmission lines now being completed. All eqpt accounted for and in good shape. Major instruments in science building ready for mounting and expect fully operative in time for IGY trial period. AURORA tower wired and spectrograph and all-sky camera mounted and in working condition prepared for first night-sky April 4. Extra project constructing hut and installing magnetograph underway. Now awaiting improved weather to make recon flight to survey route for next season traverse party.

No. 3, 15 April 57* IONO physics program delayed due to circuit difficulties, C4 recorder. Circuit diagram and instruction manual failed to reach us prior to departure Punta Arenas. 3 weeks effort to obtain radio conversation unsuccessful and now commenced exchange cw message with Mr. Bengaard at Little America. Confident IGY trial period will be met. SEISMOLOGY. Inaugurated refraction program of ocean bottom sediments. Geophones on thin bay ice with charges in open water. Shots at 1, 3, 6 and 11 kilometers. One hundred and eleven miles on Snocat finds clutch completely burned out. No clutch or clutch parts included in spares. Unless new replacement of clutch, traverse next spring greatly curtailed. GLACIOLOGY. Stake system completed for study relative ice movement. Three shallow pit studies completed. Weekly thermohm and ablation measurements. Precise 136.3 ft station elevation established through leveling. Profile depression of area. Calculation thickness of ice shelf. Snow samples oxygen isotope analysis taken. AURORA program in full operation April night sky. Aurora visible 15 clear nights since March 15. Obtaining manual twilight and aurora spectra. Exposures sodium flash indicate apparent height emitting layer 90 kms. Replaced jamming all-sky camera clock. Faulty spectrograph S-4 repaired. Variometer installed magnetic hut and recording since March 29. Obtained cooperative arrangements with Dr. Fuchs at Shackleton for alidade and paralactic photography aurora. METEOROLOGY program in full operation.

MAY SITREPS

Little America

No. 4, 3 June 57 * AURORA. Spectrograph repaired and back in automatic operation since 14 May. All sky camera affected 30% of operating time by outside lights necessary for camp maintenance. Visual obs about 19 out of 24 hours including required 3-hr intervals. 15% all aurora show symmetry: 10% to axis between Az 47 and 57, 5% to axis between Az 57 and 90. Two-thirds of symmetric forms are rayed arcs, one-third homogeneous arcs. Visual meteor obs started 26 May. Meteor radar installation to start early June. GEOMAG. Standard and visual magnetographs in operation during entire month. Rapid run to start full operation 1 June. Scaling and base line operation complete for month. GLAC. Deep pit to 11 meters. 8 strain gauges installed first 5.6 meters. Accumulation results of storm 9 to 15 May for 38 stakes show 6 cm erosion to 56 cm accumulation with average 11 cms accumulation. Oxygen isotope analysis collection started. Oceanographic operations Kainan Bay: Bottom core 30 cms long obtained at 608 meters depth. Heavy anchor lowered to bottom 27 May for use in long term ice shelf movement. IONOSPHERE. C-4 recorder in full operation since 11 May. Scaling in progress. MET OBS. All programs in full operation. 61 successful balloon ascensions with average height 18825 meters. Average difference of twice daily minimum temperature at shelter and at snow surface -2.4 during month. Carbon dioxide analyser working satisfactorily but trace rough. Infra-red hydro: meter shutter found loose and repaired, bridge circuit changed back to original specifications. Calibration appears in error. MICROMET AND RADIATION. All programs in operation except heat flux transducers. 254 wind profiles obtained during May with about 90% of logarithmic form. Some electromagnetic disturbances from communications due to lack of shielded wire. PHYSIOLOGY. Continued studies cold acclimatization in extremities. Subjects with ability to maintain higher finger temperature in ice bath appear to perform better on series of manual dexterity tests at 0° F. In general, subjects chronically cold exposed have warmer fingers when subjected to cold stresses than those who are seldom exposed. Several cold exposed subjects however have circulatory condition which mitigates against early onset of periodic vasoconstriction and dilatation upon immersion of hand in ice bath. Appears from scanty evidence that local cold acclimatization acquired with chronic exposure but modified by individual difference. Layer of cornified skin on finger tips noted in several subjects who work with bare hands at low temperature, similar to mention by Massey, FIDS, APU, 262/56 in recent paper. SEIS AND GRAV. Bottom reflection shots made Kainan Bay show many sub-bottom reflections. From reflection soundings made across barrier edge and onto sea ice at three sites, detailed profiles obtained of ice thickness variation within first 200 meters of barrier edge. Outside seis work suspended 10 May account of darkness. Data analysis seismic velocity variation with depth started. TRAVERSE OPERATION. Preparations started May with bench tests of miniature gyros. WEA CENT. Little change in receipt of weather data. Began daily wea collective broadcasts at 0200, 0800, 1400, 2000Z on 20 May. Began broadcasts coded surface, 700, 500 mb analysis and plain language synopsis on 27 May. Analysis at time of broadcast over 24 hrs old because most Antarctic data are still received very late. Expect to become more current by mid-June.

Byrd Sta

No. 14, 4 May 57* AURORA. Second dome mounted over modified pibal dome hatch. Third dome over hatch cut in standard roof panel. Bldg 11 wired. Ducts from jet heater Bldg 6 installed. All but photo supplies unpacked. Trouble in sky shutter circuits and photo counter of spectrometer, GEOMAG, Bldg 7 and 8 wired for light and heat. Vestibule constructed Bldg 8. Piers installed in tamped slush. Pier tops constructed and installed, GLAC. Weekly accumulation and daily snow temperatures read, Oxygen isotope sampling conducted after

storm May 10-11. Deep pit studies of stratigraphy, density, temperature, deformation commenced; depth 3 meters. Debris carried off by skip on highline with remote dumping from pit shelter. IONOSPHERE. Sounder in operation. Distorted frequency markers traced to sprung film drive shaft and corrective adjustments made. MET. Floodlight installed rear Bldg 2 for instrument shelter. Interior improvements. Heating inflation shelter and temperature in rawin dome continue problems. Maximum wind 34 knots, NNE; Temperature range +20 to -66. 9th thro 17th maximum above zero. Highest minimum +5 on tenth. STA SEIS. Timing circuit hooked up to geomag prog. mach. OTHER. Overhaul Snocat 'Hectori' complete except spare parts due delivery Oct and welding.

South Pole Sta

May Sitrep, 1 June 57* GENERAL. Morale and health excellent; Extensive ham radio and Navy circuit IGY science conferences with most US Antarctic stations. Only foreign IGY contact was Mirny (cw) 29 May. General science progress symposium 24 May. IONOSPHERE. C-3 operation routine except for 14 hrs due to well-hidden short in ready lamp socket. After modification to control circuits C-3 recorder producing good 35 and 16 mm records in auto dual operation. Six hours continuous eight frames per minute, 16 mm records, made 29 May. Dark room process control excellent. GEOMAG. Askania variograph functioning perfectly in pit 1000 ft from nearest bldg. Pit temp 65 F, some difficulty experienced obtaining proper damping circuit. Believed close to solution. Horizontal SEIS await repair galvanometers before installation. Tremors being recorded. Reports to begin 1 June. AURORA. Spectrograph photomultiplier transmitter burned out 9 May. Meanwhile operated manually. Repaired from radio spare parts and back in operation 20 May but broke down again 24 May and out of operation since. Overworked jet heater in tower broke down 26 May, halting all operations in aurora tower since. Preway heater installed 29 May unable to keep domes clear. Since 23 May through cooperation 2 other IGY staff hourly visual observations. Aurora visible approx 75% clear periods, least during full moon cycle. METEOROLOGY. Month characterized by record low temperature and record high wind. Radiometers operating with very little frost problems. Average height for 53 balloon flights 18970 meters, 38 diesel fuel conditioned balloons average 21025 meters. Best flight 11 mb, 27800 meters. Extreme difficulty releasing in winds over 20 kts since balloon is usually larger than 8 ft sq hatch. GLAC Light winds early half of month eradicated earlier sastrugi pattern, filling in and leaving surface smooth and rolling. Two strong storms last half of month have created strong new sastrugi patterns. Temperature gradient extends almost uniformly from -55.4 C at 50 cms below surface to 10 m depth where temperature for past six weeks has warmed from -50.56 C to present -50.28 C. Snow mine now 85 ft long and 29 deep, air temperature in mine -46 C, snow density at 5 m is .441 and temp -51 C Cold lab completed 7 May. ASTRONOMY. Observatory completed 8 May, approx 200 star shots to date. MED, BIOLOGY, PHYSIOLOGY programs progressing well.

Adare Sta

No. 6, 3 June 57* GEOMAG. Operating on routine basis. Fuel drums in vicinity of bldg have been removed. SEISMOLOGY. Temperature instability in seismic shack reduced considerably. Temperature remains near 18 F with improvised thermostat using thermograph, contact brushes, relays and batteries. Temperature drift still a difficulty in long period vertical records. Kinks in lower helix of two long period galvanometers make zero adjustment difficult. Two gales during month have rendered several days records unusable. AURORA. Started regular observations 1 June, including 24 hr visual watch. All sky camera now functioning properly. IONOSPHERE. Ionosonde in routine operation for one week. Rectifier tube in 6 kv supply and thyatron tube in voltage regulator replaced. Excessive swing in line voltage probable cause. Some programming trouble due failure in microswitch. METEOROLOGY. Operating routinely. Radiation measurement attempts terminated until spring. Average height 59 soundings 17420 meters. GENERAL.

Radio circuit with Awarua New Zealand on daily schedule. Have weekly voice radio with Scott Base. health good, morale high.

Wilkes Sta

May Sitrep, 2 June 57* AURORA AND AIRGLOW. Visibility and quality of displays much improved latter part of month. Of 405 hrs observed, 177 or 44% were clear. Aurora observed during 51% of clear hours. In marked contrast to April 62% of displays were local. If only latter half of month is considered then local or zenithal auroral displays were continuous during almost all clear hours. Displays consist almost exclusively of rayed arcs of colorless medium to faint intensity. Direction of arcs appear random and several fine pictures of arcs running parallel to geomagnetic meridian were obtained. Little meteor counting due to moonlight and extensive aurora, but spot checks reveal no increase in density above normal. COSMIC RAYS. Telescope remains in checkout status. Erratic operation is resulting in data fluctuations greater than normal deviation, total count remaining lower than designed. IONOSPHERE. Ionosonde in operation 91.2% of time. Scaling within three days of being current. Program completely ready for trial month. Mark Ridgway Stonehocker born May 15 weighing 7 lbs, 8½ oz at Portsmouth. GLACIOLOGY. S-2 ice cap station manned entire month. Snow tunnel system extended to deep pit site and pit excavation begun. Accumulation stakes in S-2 area measured. Sea ice studies made. Sea ice forming over extensive area Vincennes Bay but stormy winds beginning on 26th and continuing through 28th with peak gust of 100 mph removed all ice. Seven day attempt made to remeasure movement stakes Vanderford Glacier but bad weather and weasel trouble forced abandonment of project until early spring. Blowing and drifting snow made travel on icecap unreliable. Within week hope to have all glaciology personnel at S-2 to concentrate on deep pit. Dog-sledging trip to islets north of station show similiar bedrock types as found on Clark Peninsula. GEOMAGNETISM. Installation completed. Final test underway. Expect to be in routine operation within the week. SEISMOLOGY. Five earthquakes recorded during month. Microseismic activity generally low except during west winds when violent disturbances occur, apparently due to surf. Better temperature control has eliminated some instrumental drift. Stoppages and slowing due to eccentricity of recording drum eliminated by coupling shaft directly to drive wheel. METEOROLOGY. Upper air and surface observational programs routine and progressing satisfactory. Horizontal incidence pyrhelimeter records appear excellent for period. Recorders operating well. Snow sampling carried on at interior site during May shows small yield of water. Snow crystals also being sampled by replica method and replicas of ice crystals falling during occurrence of paraselene were made night of 20 May. May weather characterized by high winds and warm temperatures. GENERAL. Vincennes Bay frozen to 12 in. in ice thickness most of month but now open water. 323 south polar skuas banded with metal green colored bands since station established. 37 skuas dyed scarlet. 14 giant fulmars banded and some dyed. 42 Adelie penguins banded with row type flipper marker, and weights taken in molting studies. 18 birds including 7 species, and 1 Ross seal collected for National Museum since establishing station.

Ellsworth Station

No. 5, 14 May 57* AURORA observations 12 of 14 clear April nights and eqpt working satisfactorily. Vertical meteor binocular study on roof aurora tower with Poulter arrangement. Binocular amounts to less than 5 per hour for clear moonless nights. SEISMOLOGY. Tentative results reflection work find shelf 232 meters thick, ocean floor 798 meters deep. Final values depend on accurate ice velocities to be determined from pit studies and long range refraction shooting. IONOSPHERE. Troubles G4 recorder located and repaired thanks to assistance of Bongaard and tracing missing ACP circuits by Skidmore. Expect full operation schedule within week. Whistler eqpt functioning but power line hum extremely high. Many short whistlers heard barely through hum. Tweaks and dawn chorus

observed but unless hum can be reduced installation of questionable value. Attempts to reduce hum in progress. GLACIOLOGY. Detailed study of ice through four level accumulation cross sections. New accumulation-ablation area set five miles inland. 8 stakes set out. Profile run and elevation established on base line of relative movement stake system. Astronomical fine fix of station: lat 77-40. long 41-20 W carried out. Hoisting structure and snow removal skip built for deep pit. Weekly measurements carried out of thermohm and ablation areas. Navy MET program in full operation including rasonde. IGY eqpt under Fierle as follows: Wind vane and anemometer in operation. Nine light indicator working in speed and direction, with recorder working satisfactorily. Snow catcher measuring sticks and thermograph in operation since 1 April. All well.

No. 6, 31 May 57* AURORA. Outstanding display 9 May 0610Z. Spectrograph operating satisfactorily. Installed fuse in Applegate primary. H-beta photometer operating in third dome. Visual observations continuing every 15 minutes on clear nights. 5 second all sky camera exposures clear but low contrast. Magnetograph operative. Initiated program micrometeorite collection. GLACIOLOGY. Work continuing on deep pit. Present depth 6 meters. SEISMOLOGY. Used seismic amplifiers and 300 ft diameter loop in attempt study fluctuations magnetic field vertical component in little studied audio and subaudio range. 60 cps hum near camp excessive. Observations to be included in traverse program. Miniature tripartite seismic system set out to study ice shelf motion. MET PROGRAM. Thermohm recorder for use with air temperatures installed. Thermocouple recorder for use on snow surface located. 8 surface snow stakes placed 2 miles east in N-S line at 1/2 mile intervals. Reading taken once a month in dark period, more often when sun returns. Walk-out doors installed inflation shelter. Overhead door still remains. Do not expect loss of future runs. Navy personnel completed training in TMQ-5 and GMD-1A operation. Anemometer cups and windvane nine light indicators and Angus recorder working fine. Miles per day recorded each midnight. All other met eqpt will be running by 1 July. IONOSPHERE. C-4 ionosphere recorder in operation about 75% of time because of continuous difficulties in control circuit. Cause unknown. Expect send weekly data summaries middle June. Whistler program suspended until hum from power line can be reduced, either by successful operation of generators or by relocation of loop antenna. Unable to keep generators in phase when running parallel. Remedial action under study. Navy personnel manning station all phases 100% leaving civilian IGY entirely free to pursue their program. All well with high morale,

May Weather Averages

	Little Am	Byrd	Pole	Adare	Wilkes	Ellsw	McMurdo
Temp, ave	-23.4 F	-32.4	-78.3	-9.4	+10.8	-14.4	-10.7
Temp, high	+30.2	+19.6	-31.9	+10.4	+42.0	+17.1	+14.0
Temp, low	-63.4	-66.5	-100.5	-27.4	-14.0	-63.9	-36.0
Ave Wind dir	SE	NNE	034	SW	NE		E
Ave Wind Speed	13.8 kn	16.5	15	7.5	12	13	13
Peak Wind Gust	67	34	47	67	87	65	83
No. Clear Days	15	15	19	11	7	4	13
Partly Cloudy	-	8	8	7	10	12	10
Cloudy	16	8	4	13	14	15	8

JUNE SITREPS

Little America

No. 5, 2 July 57 * AURORA. Visual program obtained hourly with help of Navy and IGY volunteers. Most displays are draperies and rays. Majority symmetric displays have axis azim 65 to 80 deg true. Spectrograph on semimanual operation due to breakdown of photomultiplier transformer. K 100 all sky camera developed failures in shutter and winding mechanism and has been replaced by spare camera. Meteor radar eqpt being installed in ionosphere bldg. Visual meteor counts made 7 hrs during June. Max rate with binoculars directed toward zenith is 5 per hr. No texture observed. GEOMAG. All phases geomagnetic observatory routine operation. Largest disturbance recorded to date on 30 June when storm bay centered on 1200Z attained following ranges: decl 70 20', vert intensity 816 gammas, horiz intensity 1240 gammas. Observations for station lat and long began. GLAC. Deep pit to 18 meters with studies in progress of densities, temperature, grain size and crystal size. Oceanographic oper Kainan Bay: Ocean currents measured hourly for 24 hrs in period 10-11 June showed max current about 0.5 knots from southerly direction with poorly defined superimposed currents possibly of tidal origin. IONOSPHERE. Normal operations C4 recorder interrupted by several equipment failures with total loss of nearly 30% scheduled times. MET OBS. All programs in routine operation. 62 successful balloon ascensions made with avg height 18040 meters. MICROMET AND RADIATION. Schulze net radiometer continues in operation. Measurement of outgoing radiation to different zenith distances made using Linke-Feussner actinometer. Halo observations made 11 days. Continuation of wind profiles made on reduced scale as life expectancy of counters has been passed. 90° profiles measured. Temperature profiles being recorded about 50% of time with extensive efforts made to filter out spurious signals. Heat flow meters in preliminary operational tests. PHYSIOLOGY. Carried out second nutritional survey. Commenced preliminary thermal balance studies. Reducing data from earlier experiments. SEIS AND GRAV. Studies of seismic velocity variation with depth from short refraction studies completed. Gravity obs at approx 2 hourly intervals started 11 June, to continue through 13 July. Information obtained on ocean tide amplitude and principal components. TRAV OPER. Miniature gyro tests completed. WEA CENT. Alfa, data. All mother station data being recd on twice daily schedule but not always regular and some data 2 or 3 days late. Reliability of reception of NZ and Australia 65 to 70%. Unable to receive So. Africa and So. Am. Deception has occasionally relayed some So. Am. station data at Alvarez request. Mirny now relaying Kerguelan reports. Bravo, analysis. At present 0600 sfc analysis on 2000 collective, 24 hrs after synoptic time. 0000Z 700 and 500 mb analyses bcst on 1200 collective, 26 hrs after synoptic time. Analyses now relayed to Weather Wellington. 27% of scheduled bcsts sfc analyses could not be made because of insufficient data. Australian RATT not as yet on 19690 kcs for 24 hrs per day. GENERAL. Microfilm camera set up and tested. Two round-table discussions with US IGY bases on amateur radio scheduled with poor results. Schedules continuing on weekly basis.

Byrd Sta

No. 15, 01 July 57 * AURORA. All sky camera and spectrograph tested, repaired, mounted, operating satisfactorily. Visual aurora obs begun. Spectacular display involving at least 8 red aurora June 30. Jet heater ducts and fans installed in domes and experimenting with outside intake on jet heater. Tower withstood whole gale June 26 and bolts in structure intact. GEOMAG. Timing circuits, geomag and sta seis tested. Installing standard magnetograph, ready for test in week. Drifting snow over entrance to bldgs seven and eight troublesome. GLAC. Accumulation total since March 12: 17.4 cm., for June 3.1 cm., June 9 to 15, 2.7 cm. Snow temperature ranges in minus deg C: Surface 26.45 to 45.15, half meter 31.95 to 38.15, one meter, 32.20 to 35.00, two meters 30.85 to 31.95, Four meters 28.25 to 29.18, eight and sixteen meters constant. Deep pit at 8 m. using core auger for densities from 4 m. owing to snow hardness. IONOSPHERE. RWD and SWI sounding program carried out. Abandoned continuous 24 hr run for 16 mm film record owing to overheating sweep motor.

Training scaling assistants. MET. Routine sfc and upper air obs. All sixty raob flights, ave height 16256 m. STA SEIS. All wiring complete. Test records made all seismo elements. Determining gain settings for periods of relatively quiet and for disturbances such as D-8 operations. North-south horiz seismo required releveling. Record developing procedures in photo darkroom satisfactory. OTHER. Star shots for sta position give $79^{\circ} 59' 11.5'' + 1.5''$ Lat, $120^{\circ} 00' 56'' + 10''$ Long, taken from Bldg 3. Byrd Sta IGY Commencement greetings to Kaplan and Nat'l Committee, Gould and Antarctic Committee, Wexler, Panels, Project Leaders, Nat'l Acad IGY staff and colleagues in Antarctica.

Pole Sta

June Sitrep, 8 July 57 * GENERAL. Morale excellent, health generally good. Recent end on end SWI and WK Programs prove heavy strain on personnel. Increased observations, processing of records, instrument maintenance and camp duties pressing all hands. Approx one man day per day of IGY group consumed by various duties: mess cook, snow mine, household and maintenance. Excellent cooperation Navy pers increasing their work loads proportionally. Required 15 min visual AURORA observation worst strain. Despite assistance Landolt has averaged 18 hrs duty per day past 6 days. Fatigue may effect quality of observations and interferes with other disciplines. Value of such frequent visual obs is highly questionable when all-sky camera is functioning. It would help to have a logical explanation of same. These comments are sta sci leaders obs and not generated by personnel complaints. MET. Obs continue routinely during month. All 4 personnel served out their respective week mess duty ending first round. Complete good record of balloon releases but procedure very laborious. Rawinsondes average 18119 m for 69 flights including soundings every 6 hrs from 26th through 30th. Only flight missed 18Z on 27th when hydrogen generator became overheated. GLACIOLOGY. Development of light table for transmitted light photo record of snow stratigraphy appears promising. Remington trading time as aurora observer in exchange for pit digging help later. Unfortunately he has lost approx one third time past month because of undetermined ailment deterring outside work. Mine depth approx 9 meters. SEISMO. Camp vibrations prevented operation horiz seismometers close to science bldg. Both were moved out to vertical seismo pit 1000 ft from closest bldg. 7 conductor cable borrowed from met connects to recorder in science bldg. Full operation hindered by galvanometer malfunction. Attempted repair underway. No report from Washington whether 12 quakes reported between 10th and 29th June were recorded by other stations. Benson dividing his 16 hr work day among iono scaling, aurora obs, and working on seismograph installation. AURORA. Aurora observed 28 days during month. 1224 visual obs made in June. Most unusual display of month was around 1200 on 30th consisting of large portion of sky red glow. All sky camera out of operation 8th to 10th and on 29th because of camera malfunction. Recommend spare camera backup be made available for next year. Total all-sky camera 16 mm film to date 1300 ft. Other lost time during month due to heater or spectrograph troubles. Spectrograph now permanently on manual control, has been operating about 50% of time. Jet heater removed from tower. Second preway space heater installation, with help of 5 turbine fans keep domes clear at cost of approx 15 gal fuel per day. Limited meteor observations reveal no unusual numbers. IONOSPHERE. C-3 in continuous operation all month. Approx 2 hrs of records lost due to power line interruption. Scaling of records maintained about 2 days behind. Hough spending much time on instrument repair, his own and other disciplines. Ionosphere very erratic during month. 100 ft continuous 16mm records made during time sun was farthest away. GEOMAG. Records uninterrupted. However, some difficulty with time marks and light intensity. ASTRO. Results of approx 400 star shots with Wild T-3 theodolite fixed position of instrument in pibal dome at 2400 ft from current spin pole on grid bearing of 336° . Probable max error plus or minus 100 ft. Observations hampered by variable refraction and image distortion, greatest under coldest and calmest conditions. PSYCHOLOGY. Mid winter tests completed. Volunteer projects lagging. BIOLOGY. 9 samples of snow filtered and cultured under sterile conditions for fungus growth. Two growths have appeared so far.

Adare Station

No. 7, 9 July 57* GEOMAG. Variograph developed high resistance in 20 deg mercury contact of heat control system. Operating satisfactorily on 10 deg contact. SEISMOLOGY. Lower helix on one galvanometer bad. Will replace. Otherwise situation unchanged. AURORA. Fault in integrator of spectrograph being repaired. Full aurora operation in month of June with aurora observed every clear day. Allsky camera functioning well except for timing trouble due to frequency fluctuations of main power. IONOSONDE. Trouble attributed to high tension supply in Sitrep No. 6 now traced to incorrect wiring in all four rectifier tubes. 6 volts applied to only one side center tapped filaments. Pulse generator trouble due PRF control open circuit, now corrected. Normal program continues including 5 min. intervals World Days. AURORA, IONOSPHERE, SEISMIC data transmitted daily to New Zealand. METEOROLOGY. Stormy period June 10-22 reduced sounding number to 45. High local horizon caused flight termination 10 times and terminated winds 12 times. Average height 45 soundings 16499 meters. Walk-out doors added to inflation bldg now permit releases from ground. Weekly voice contacts Scott base continue. Health good, morale fine.

Wilkes Station

June Sitrep, 2 July 57 * All disciplines operating on routine basis at end of month. IONOSPHERE. Ionosonde in operation 96.7% of month. Good correlation between absorption, visible aurora at zenith, and horizontal magnetic intensity during sudden commencements on June 3 and 4. High absorption began near 1200 local time 22 June and continues except for decrease during June 28. High voltage supply filament wiring error corrected. Order placed for next years supply. COSMIC RAY. Ventilation of cosmic bldg apparently stopped erratic operation of telescope. Total count remains lower than design. Count approx 2.5 times below similar eqpt at Mawson Sta. GLACIOLOGY. Three-man glaciological party at S-2 (icecap sta) for entire month. Star shots taken by Charlton, Navy ETC, and Molholm on June 10, with computations by LtJG Burnett show S-2 Sta at Lat $66^{\circ} 27' 30''$, Long $111^{\circ} 16' 30''$ East. 13 cms of snow accumulated at S-2 area from March 20 to June 18. Deep pit begun June 4 with initial excavation and construction of suitable roof. Snow skip drawn from pit by weasel not put in operation until June 21. Pit depth now 10.5 meters. Density measurements in pit taken to 9 meters, and stratigraphy studies to 4 meters. Unexpected melt layers have been encountered. Erosional structures in some strata provide indication of prevailing wind direction. Oxygen isotope samples being taken from pit. Stable temperature at 10 meters and below indicate mean annual air temp of -19.4° F. Met obs taken every 3 hrs excepting at 0400. Dewart visiting ramp sta weekly to change thermograph records and read thermohms. SEISMOLOGY. Vertical instrument still drifts when temp change is rapid. Microseismic activity low. Long period disturbance associated with seiches in local bays has disappeared since ice formation in early June. 240# surface explosion on ice cap at 20 miles inland has negligible effect on long period instruments. 7 earthquakes recorded for month. Data being sent C&GS. AURORA. Pronounced increase in auroral activity with appearance of solstice. 441 hrs observed, of which 300 or 68% were clear. Aurora occurred during 50% of these clear hours. 72% of displays were local. First bright colored aurora seen early June. First auroral spectra obtained June 3. Oxygen lines and nitrogen bands identified. No hydrogen lines visible. Direction of rayed arcs continued to be random with arcs running parallel to geomagnetic meridian a common phenomena. Both instruments operating satisfactorily. GEOMAGNETISM. On routine basis from June 9. Approx ave values of elements for June : Dev $34'$; H 9300 gammas; V 74800 gammas. Most severe storm since recording begun in late April occurred on June 30 with sudden commencement in D and Z at 0528.2 GMT. Duration storm approx 20 hrs with total in D, H and Z of $5^{\circ} 29'$, 1035 gamma, and 1205 gammas resp. MET. All phases of program operating satisfactorily. June upper air soundings ave 18762 meters, 2 missed due excessive winds. June wea characterized by clear skies, light winds and light precipitation. Large area of open water extends from Bailey Island past Frazer Island to horizon.

Thickness of bay ice to one mile of shore Clark Point is 26 in. GENERAL Charlton, ETC, installed an RT-77A-GRC-9 transmitter and receiver and antenna 440 ft wire at icecap sta: I (Eklund-Ed.) spent several days at this sta helping with installations. Morale at midwinter point higher than ever.

Ellsworth Sta

No. 7, 30 June* AURORA. All sky camera damaged spring mechanism K1-100. Spectrograph operated manually seven days while repairing photometer power supply. Obtaining continuous measure of auroral activity by photographing every minute external spare photo counter. Peak of large displays fairly consistantly at 1930, 2230, 0200 local time. Hotel Beta intensity increases very rapidly by factor of 5 to 20 at break up lasting one quarter to one minute. Pulsating aurora obs in 4861 peak to peak time clusters about 5.1 sec. Overhead vortex June 18-19 counter-clockwise in direction, decreasing radius of curvature. Unaided eye meteor count 12 per hour. GLACIOLOGY. Work continuing on deep pit project. Present depth is 17 meters. GRAVITY. Weddell Sea tides reflected in gravity obs. Measurements every two hours with cooperation of Malville, every hour on selected days maximum variation during new moon 1.02 milligals. Gravity ties to Belgrano and Shackelton last February. IONOSPHERE. Program in operation approx 95% until June 20. Trouble with circuit breakers in ACP unit developed and made further continuous operation impossihle. When this trouble repaired operation should be rather routine. Whistler eqpt soon to be relocated at site farther from center of station in effort to reduce hum which now limits hearing to only loudest whistlers and dawn chorus of which there have been a great deal particularly during SWI. Eqpt has been in operation normally otherwise. METEOROLOGY. Radiometer placed in service 200 ft SE met bldg on 11 June. Readings taken in good clear weather. Copper-constantan thermocouple now working in conjunction with radiometer. Main worm gear in movement plate of anemcmeter giving trouble. Teeth on gear beyond repair and should be replaced. Wind direction transmitter spindle bent upon unpacking. Numerous attempts made to put this instrument in service but to no avail. This spindle should be replaced. Three thermchms mounted and in service June 23; 5 m in air, on snow sfc, and 5 m below snow surface. All thermohms 300 ft SE met bldg on or below weather tower. Readings taken ea 6 hrs. All winter eqpt in service and now working on solar eqpt to be mounted at first sight of sun. Only 2 raobs missed this month because walk out doors added to inflation shelter. Ave height 14600 meters. All well.

June Weather Averages

	Little Am	Eyrd	Pole	Adare	Wilkes	Ellsw	McMurdo
Temp, ave	-9.0 F	-28.3	-69.5	-5.0	+ 14	-27.0	-10.7
Temp, high	+24.8	+3.6	-42.3	+19.4	+36	+8.1	+13.0
Temp, low	-50.8	-70.4	-97.1	-36.0	- 14	-54.0	-38.0
Rvg Wind dir	SE	N	180 Gr	SW	S	NW	E
ave Wind Speed	15.0 kn	15.5	17	16.6	7.7	13	16
Peak Wind Gust		53	33	80	54	37	84
No. Clear Days	5	13	27	9		4	12
Partly Cloudy	8	9	3	19		23	5
Cloudy	17	8		1		3	13

IGY ANTARCTIC STATIONS, 1957 (exclusive of Palmer Peninsula sta)				
NAME OF STATION	COUNTRY	LATITUDE	LONGITUDE	ELEVATION
	NORWAY	70-38 S	02-32 W	60 m
Halley Bay	UK	75-31	26-36	30
South Ice	UK	81-56	30-00	1480
Shackelton	UK	77-57	37-16	41
Ellsworth	USA	77-40	41-20	42
Byrd	USA	80-00	120-00	1515
Little America	USA	78-12	168-12	45
Adare	NZ-USA	72-18	170-18 E	5
Scott	NZ	77-50	166-44	15
McMurdo	USA	77-53	166-44	45
Charcot	France	69-22	139-02	2400
Durville	France	66-40	140-01	40
Wilkes	USA	66-15	110-35	12
Bunger Oasis	USSR	66-18	100-49	29
Vostok First	USSR	72-08	96-35	3000
Pioneerskaya	USSR	69-40	95-40	2700
Mirny	USSR	66-33	93-00	30
Davis	Australia	68-32	77-55	12
Mawson	Australia	67-36	62-53	14
Showa	Japan	69-02	39-36	15
South Pole	USA	90-00	-----	2800

Midwinter Greeting messages received from MIRNY; ROYAL SOCIETY; ANTARCTIC DIVISION, MELBOURNE; MAWSON AND DAVIS; PAUL EMILE VICTOR & EXPEDITIONES POLAIRES FRANCAISE; SHACKELTON AND SOUTHICE; DURVILLE AND CHARCOT; USNC AND ACADEMY IGY STAFF; CHET TWOMBLEY (sole IGY representative at Little Am during DF I).

IGY Commencement Greeting messages received from CSAGI AND CHAPMAN, PRES; NATL ACADEMY OF SCIENCE, BRONK, KAPLAN, ODISHAW; O'HIGGINS BASE; DECEPCION BASE.

4th of July Greeting messages received from MIRNY; FRENCH EXPEDITION; O'HIGGINS BASE; DECEPCION IS BASE.

JULY SUMMARY

Little America

No. 6, 2 Aug 57 * AURORA. Visual program routine with hourly obs throughout and continuous obs during World Days and major displays. Spectrograph in semi-manual operation with exposure time set according to estimated sky brightness. Failure of spring of K100 camera resulted in loss of records of several displays. Remedied by coil spring. Continue to lose several hrs per day due to necessary camp lighting. From limited visual meteor obs obtained max 5 per hr with binoculars at zenith, 6 per hr with unaided eye in 45° cone toward zenith. No texture observed. Meteor radar set up in ionosphere bldg for operation jointly with iono discipline. Noise level in frequency band of eqpt very high. Investigation of possible noise sources underway. GEOMAG. All phases geomagnetic observatory in routine operation. Star obs for lat, long and az continue. GLAC. Deep pit operations limited to density and stratigraphy studies. 198 determinations of density made including foll approx values: 0.46 at 5 m, 0.54 at 10 m, 0.59 at 15 m. Unable as yet to find parameter necessary for outlining annual accumulation. Movement stakes across crevassed valley N of camp show expansion ratio of approx 0.002 per month or 12 ft across 1300 ft valley floor since late Feb. Oceanographic anchor and cable for use in absolute movement studies lost when wire parted early July. IONOSPHERE. CA recorder operating on routine basis. Loss of 19 hrs operation during month for eqpt repair. MET OBS. Surface and upper air obs continue satis. Total of 67 upper air soundings average 13180 meters. Net accumulation on 4 snow stakes during July 3.5 cms. Snow drift density from lit Rose sampler 0.278. MICROMET AND RADIATION. Schulze, Beckman and Whitley net radiometers operating throughout month. Continued measurements outgoing radiation to different azimuth distances with Link-Teussner actinometer. 34 calibrations made of Schulze net radiometer for long wave radiation. Halo obs made on 11 days. Continue temp and wind profiles. 182 wind profiles taken. Wind counter system operates satis despite expenditure of expected life. Heat flow transducers in operation at surface since 4 July. PHYSIOLOGY. Second series BMR determinations and exposure to standardized cold stress in cold room 80% complete. Physical fitness being assayed by determination of oxygen debt during submaximal exercise. SEIS AND GRAV. Analysis of records from seismic sites away from barrier edge completed. Tables and charts made up for ice thickness and water depth measurements. Main seismic shelf thickness methods are shear wave reflection, reflection of compressional wave transformed to shear wave at ice-water boundary, average velocity of wave reflected from ocean bottom and double reflection from ocean bottom with second part reflected downward from ice-water interface. Shelf thickness varies from 240 to 320 m, surface to ocean bottom 630 to 660 m. No reflections obtained at site 40 miles along Byrd trail. Gravity observations for tidal amplitude concluded 13 July with 363 values in 33 days. Main tidal period 24 hrs, max amplitude during full and new moon approx 1.4 m. TRAVERSE OPER. 2 Snocats checked out in garage, permanent installation of gyro, radios, etc plus shelving completed. Damage to differential of third Snocat, and spare parts not available. CA traverse food 60% repacked in 30 man day units. WEATHER CENTRAL. Mawson now sending their wea to McMurdo via Mirny. Three skeds per day established with Mirny. Trying to increase number with other Hother Sta. Received excellent cooperation from McMurdo in setting up new skeds. Beginning 1 Aug Mirny is making 4 daily wea collective bests at 0200, 1130, 1300 and 2100 GMT, freq 14550 kc. Our wea collective best times effective 1 Aug are 0415, 1015, 1615 and 2215 GMT. Will have special best for analysis and syn at 1900 GMT. Mirny will rebroadcast our analyses at 0200 GMT. Mirny now relaying few South African synops and our collective includes selected Australian and New Zealand reports. Reliability of receipt wea data from New Zealand and Australia about 80%. Total comm blackout July 4 and 5. 5 surface and 2 scheduled upper air analysis missed due to insuff data. GENERAL. Microfilming of scientific data and records in progress. Weekly round table discussion over amateur radio with US Ant stations held for aurora, glaciology, ionosphere and met disciplines with usually two or three stations in addition to LA.

Byrd Sta

July Sitrep, 3 Aug, 57 * AURORA. Aurora observed 27 days. Hourly obs begun 12th with Bentley, Giovinetto, Ostenson, Toney assisting, 150140 probable flaming rays in zenith, very bright red and green, 200238Z bright spot two degrees diameter in zenith, inside red, periphery yellow, whirling clockwise during two or three sec. Outside intake duct of rubberized cloth from floor opening to jet heater and trap door in aurora observatory access shaft reduces dome frosting. Two ducts and eightieth apron keep dome clear for one observation at -70 F. Camera ~~clock~~ losing eight minutes per day due to frequency variation. Camera inoperative since 28th due failure governor and resultant break in main spring. Spectrograph inoperative 7th thro 10th due lodged cam pin. Program manual since 29th due to trouble in apogate unit. GEOLAC. Standard magnetograph under test ops. Eliminated control circuit ground lead since difference of potential gave false reading on two amp trace lamp meter. Drifting snow around Bldg 7 and 8 doors continue problem. GLAC. Accumulation during month 3.1 cm. Temperature at 828.1 cm equalling 16 m temp. Deep pit about complete at 12 m. Weekly nit deformation measurements show approx 5 mm closure at top since May. Coring planned to limit of facilities for density, stratigraphy, photography. Oxygen isotope and tritium sampling begin early Aug. IONOSPHERA. Scaling up to date, Forency assisting. First F1 layer noted 190839 local x Necessary to extend delta antenna transmission lines due weighing down by snow load. METEOROLOGY. Critical logistics, fatigue, forthcoming additional work load of daily fests and hourly obs make four a day raobs on World Days impractical. Shortage of expendables compel limitation of hydrogen charges to two per sked flight. Great accumulation and drift July make nec decision to relocate radome from roof Bldg 2 in spring. Map plotting of upper air analyses begun. Correlating between apparent jet stream at 27000 to 30000 ft as preliminary to storm conditions verified after three months study. 28th and 29th theodolite rabal site relocated from snow sfc to top Bldg 2 adjacent radome. 28th and 29th meridian passage shots of Nadar for GMD and rabal orientation. Five attempts to complete rabal thwarted by blowing snow and low overcast. Investigating temporarily inoperative windvane on Bldg 4, personnel shocked by arcing from fractured rib accident of 13th. Johns steam condenser drum between hydrogen generator and balloon modified, perfected. 59 regular sked daily raobs average 16948 meters. STN SLIS. Scheduled operation began 6th. Recorded 20 disturbances. Extreme microseismic activity. Difficulty eliminating RF interference. TRAVELER. Modified interior seis Snocat Hecteri to balance eqpt load and improve gravity readings through floor. Installed magnetic compass. Bench tested gyros. Devised calibration unit for magnetometer. Planning Snocat and sled loads for summer.

SOUTH POLE STA

July Sitrep, 1 Aug 57 * GENERAL. Health and morale excellent. No sign of twilight in sky. METEOROLOGY. Work progressing normally. Average height 71 radiosondes 16103 meters. Johnson has built a device to take time lapse movies of snow down formation. AURORA. 1166 visual obs in July, aurora seen on 30 days. All sky camera full operation except 34 hours due to electric failure in camera and shutter trouble in K-100 movie camera. 1000 16 mm records for July. Spectrograph operated entire month except 39 hrs due combined shutter and electrical trouble. Operation entirely manual. Limited meteor observations continue. SEISMO. Vertical in operation all month. Some records possibly lost during efforts to obtain optimum recorder circuit characteristics. Horizontal galvanometers installed 16th July after 2 wks intensive repair efforts involving soldering all suspension fiber points. These not yet functioning properly. Horizontal may not be in reliable service until new shipment of galvanometers arrive. GLACIOLOGY. Dual purpose snow mine progressing slowly. After 4 mo and some 600 man hours the shaft penetrates down average 18° slope 120 ft to depth of 40 ft. 9000 cu ft or approx 115 tons snow removed. Cross section irregular, height varies from 6 to 19 ft and width 7 to 16 ft. Ambient temp -60 F limits working periods to max 3 hrs at a stretch. Ave density at lowest level .50. temp 61.6 F. Remington recovered since

mid July from anebiasis. Photo records progressing well. IONOSPHERE. 35 mm records 97 % complete for July and about 100 ft of 16 mm records were produced. Began ABC four hrs per day 10 mm records 25 July. Hope to continue sked indefinitely. Second tube failure occurred when type 813 in line voltage regulator lost its heater. Frequency plots for 15 days of July present the definite impression of diurnal variations in the ionosphere. Most obvious characteristic is the critical frequency of the F region which is higher and holds steadier during Greenwich day mornings. IDH master clock with original pendulum straightened maintained constancy within plus or minus one tenth sec. GEOMAG. Continuing efforts have failed to register components simultaneously but still trying. Science lecture program continuous two evenings per week.

Hallett Sta (formerly Adare Sta)

Sitrep No. 8, 5 Aug 57 * GEOMAG. Operating routinely, have noted agreement between onset geomagnetic disturbance and enhancement aurora activity. SEISMOLOGY. Faulty suspensions in horizontal component galvanometers reannned. All working again, adjustment in progress. 45 quakes recorded in July. AURORA. Spectrograph now functioning properly. Auroral activity somewhat weak. All-sky camera operating satisfactorily with good results on 10 sec cam. IONOSPHERE-L. Operated routinely until last week July. End of sweep microswitch mounting worked loose and astigmatism control in 35 mm display unit caused loss of less than 2 days records. Both troubles cleared up. METEOR CLOGY. All operations continuing, 62 regular and 6 extra World Day soundings produced an average height of 13864 meters. 15 raobs terminated due local high horizon. 26 wind ended for same cause. Blowing sand and gravel removed glass bulb from mounts of pyrholiometer. Sun reappeared Aug 2nd. New low temperature -44° F Aug 2nd. Health and morale of personnel fine.

Wilkes Sta

July Sitrep, 2 Aug 57 * GENERAL. All disciplines operating routinely except for additional testing cosmic ray eqpt. Aided in survey of unmaped islands north of station. Dewart and Eklund made weasel trip along coast to Lalaena Is 24 mi NE of Wilkes. 4 men volunteered 2nd year for proposed 1958-59 traverse. AURORA. Visibility and auroral activity much poorer this month. Of 457 hrs observed 40% were clear. Aurora occurred during 60% of clear hours. 24 % were low north only displays. Only July 14 display was colored or stronger than medium in intensity. Spectra made of red aurora during night 30 June show clearly the first three lines of Balmer series. Atomic oxygen line greatly enhanced at expense of positive and negative groups of nitrogen which, though present, are very weak. The forbidden transition line of atomic nitrogen at 5200 A also very strong. By contrast the bright display SW1 of 1 July shows no trace of hydrogen and nitrogen band systems. Both red and violet are exceedingly strong. In all approx 46 lines are visible in each spectra. Instruments continue to operate satisfactorily and required no repairs. IONOSPHERE-L. Ionosonde in operation 98.5 % of month. Continuous film record made during part of storm on 1 July and of 15 July as a quiet day. Scaling and median calculations current. High absorption conditions existed 1-6 July and to a lesser degree on 25th and 29th. COSMIC RAY. Modifications and adjustment suggested by Dr. Swetnich thro fine effort Wm Potter, W31XU, have improved operation and may have eliminated half telescope deviations attributed to room temperature changes. Testing continues and it is hoped to obtain correct operation this month. GLACIOLOGY. Firn pit to 23 meters. Density taken to 23 meters. Density at that depth .74. Oxygen isotope samples taken to 16 meters. Able to discern annual layers in firn, 207 wea obs taken, continuing S-1 obs. GEOMAGNETISM. Rather quiet month after subsidence of 30 June storm. Approx avg of elements for month: D, 82-38; H, 9380 Z, 64770. Latter value very approximate due to several baseline shifts. From hourly averages for month mean diurnal in D and H is about 23 min and 915 gammas somewhat less than for June. Trouble with program machine during month due to aspheroidal beads which make it impossible to adjust time circuit contacts

without having concurrent stoppages and absent time lines. Dest adjustment so far produces as many as 3 missed lines per hour on R records with an occasional extra line on std record. SEISMOLOGY. 8 earthquakes recorded, microseismic storms 6, 7, 15, 20, 25 and 28th. Drift in vertical instrument considerably improved by better temperature control. Recommend re-establishment of instrument on raised concrete pier and rewiring next year. Impossible this year due to lack of cement. METEOROLOGY. No new eqpt installed. 59 scheduled flights avg 16496 meters. 3 missed due to high winds. Snowfall occurred on 18 days. Ice log entry for 30th show open water beyond line extending from Bailey Is, east of Frazier Is., to horizon 18W. All well.

Ellsworth Sta

Sitrep No. 8, 31 July, 57 * AURORA. All sky camera back in operation. Spectrograph operating semiauto while repairing amplifier and integrator. Sample spectrograph data of period June 14 to July 21 316 spectra obtained with 149 properly exposed aurora spectra 78 exposures of hydrogen alpha, 12 of atomic nitrogen at 5200 A, 3 show a symmetrical Doppler broadening at mag zenith. Great variations relative intensities hydrogen alpha to first positive bands. Exposures varied between 20 min to 3 hrs. Hydrogen beta spectra and hotel beta photometer not showing proper correlation. Interference filter half width apparently too great. IONOSPHERE. Troubles with CA circuit breaker. Present since beginning of operation, was eliminated during past week. Expect to catch up with scaling of records during coming week. Have observed fairly regular appearance of sporadic foxtrot layers and occasional sporadic echo layers as low as 69 kilometers. Whistler gear relocated in aviation bldg on 16 July with much improved signal to noise ratio. Whistler activity remarkable. Often received whistlers at rates too high to count. Multiple whistlers appear to be the rule. Dawn chorus recorded most every day. GRAVITY. By hourly measurements for amplitude of Weddell Sea tide concluded 20 July. TRAVEL SE. Made 400 trail flags and 5 man party given lectures stressing preventive health measures and first aid treatment. METEOROLOGY. Punch cards, wca summary, sta history and climatic reports for the past month were all brought up to date. Have been using diesel oil in the process of balloon conditioning since 1 July with an increase in height. Have lost 6 soundings due to wca and high winds, avg height for 56 runs 16630 meters. No new eqpt installed this month. GLACIOLOGY. Deep pit at 29.5 meters. Cross-section 3 meters by 3 meters at top, 2.5 by 2.5 meters at 20 meter depth, 2 by 2 meters at bottom. All well.

July Weather Averages

	Little Am	Byrd	Pole	Hallett	Wilkes	Ellsw	McMurdo
Temp, avg	-32.1 F	-41.3	-59.4	-13.6	-0.4	-27.4	-16.0
Temp, high	+ 6.1	- 5.1	-40.7	+ 6.8	+26.6	+ 9.9	0.0
Temp, low	-61.1	-69.9	-97.8	-44.0	-27.4	-61.1	-40.0
Ave Wind dir	SE	NNE	340 E	SW		S	E
Ave Wind Speed	12.6 km	19.0	15	9.6	9.1	13.5	12
Peak Wind	34	45	37	58		46	57
No. Clear Days	10	14	23	4		3	11
Partly Cloudy	11	12	6	21		23	9
Cloudy	10	5	2	6		5	11